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HOUSE HEATING

WE have kept our readers fully informed about the work being carried out at the Building Research Station of the Department of Scientific and Industrial Research on the heating of homes ("heating" including water heating, cooking, and the airing of clothes, and study of ventilation and air change generally). The first report on this ambitious and costly series of trials in 20 experimental houses at Abbots Langley was published last week and discussed at length at a meeting of the Royal Institute of British Architects. We were present at the meeting and record our impressions in our issue to-day. The report—it is an interim one—is a technical exposition to architects and "others concerned." "Others" include every supplier of fuel and all manufacturers of heating, cooking, and water heating equipment. It may be recalled that the purpose of the experiment is to ascertain the relative economy, efficiency, and amenities of different forms of house heating, with the exception of district heating. Installed in the houses at Abbots Langley, which we have visited, are 19 different combinations of appliances for space heating, domestic hot water, and cooking. The houses have been divided into three groups, in which the space heating systems are intended to provide "partial," "two-stage," and "whole house" heating respectively. In the "partial" group, in which there are eight houses, the living rooms only are heated by an open fire or a modern "improved" appliance; the halls, bedrooms, and bathrooms are unheated. In the "two-stage" group, in which there are also eight houses, the whole house is supplied with background heating, usually by convected warm air, and, when the room is to be used, the topping-up heat is provided by radiant fires. In the "whole house" group, in which there are four houses, the system is designed to keep the whole house warm.

The experiment has been divided into two phases. The first has now been completed. In it the houses were furnished but unoccupied, and were run by laboratory staff to a strict routine which was made, as far as possible, typical of the life of a family consisting of father, mother, and two children of school age. It is this period that the report covers. For the second phase the houses have been rented unfurnished to tenants drawn from the local authority lists. This phase is now in progress, but no reports on it have been prepared, as this is the first heating season that the families have been in occupation. The measurements taken during both periods are the same, covering, among other aspects, air temperatures inside all rooms, the rate of air movement through the house, the amounts of hot water drawn off and of fuel going into each appliance. During the occupied phase the positions of every door and window will also be automatically recorded.

The houses were all built to a good standard of thermal insulation to minimize the loss of heat through the walls and roof. In fact, these houses are considerably better insulated than those built before the war and than many being built to-day. The first information to be obtained from the experiment showed the importance of insulation in relation to house heating, for the houses did not cool down during the night nearly as much as had been expected—even where the only space heating appliance was an open fire in the living room. It had been expected that temperatures of 45°F. to 50°F. would be experienced, but even in the worst heated house they did not drop out of the range of 50°F. to 55°F. except during a week of freezing weather when some of the unheated bedrooms approached temperatures of 45°F. In the houses with "improved" heating systems even higher temperatures were maintained. The doors and windows were kept shut during the unoccupied phase, and it was found that these modern houses in their semi-rural setting were receiving, most of the time, more than the amount of fresh air that experts consider is necessary to ensure healthy living conditions.

The fuel consumptions for a whole year have been worked out, including space heating, cooking, and supply of hot water. The calculations were based on the data obtained last winter (1947-48). The fuels consumed—gas, electricity, coal, and anthracite—have been priced on the basis of prices prevailing in the London area in April, 1948. At these rates some surprising results are found. The annual costs of houses with central heating in the "whole house" heating group are among the cheapest. Such systems, states the report, are much cheaper to run than the combination of an open fire and an independent boiler, and they also compete successfully with closeable stoves or improved versions of the open fire, such as the type with a lid to close down and keep the fire alight all night. There are, however, several difficulties. In the first place, the highly efficient boilers used with the central heating systems require graded anthracite, and this fuel is not available in quantity. The report's findings must be regarded with this in the background. Further, a central heating appliance is not nearly as cheap to instal, as, say, an open fire with a back boiler. It was necessary, therefore, to find out how much the different heating systems cost to instal.

The Chief Scientific Adviser's Division of the Ministry of Works, which has been studying the cost of house building, undertook to cost the various systems as if 50 of each type of house was being built in the London region. The prices include the heating appliances, chimneys, ducts, vents, hot water piping and tanks, gas installation, and any extra electrical installation over and above that normally supplied. Including all these items the installation cost of central heating is more than twice as great as that of the open fire with back boiler. To show the effect of the capital cost and the annual costs together, the former is spread out over the years on a "hire-purchase" basis. Annual flat rate charges were computed for the payment of the extra cost over 60 years at 2½%, and for repayment over 40 years at 4%. With these charges added to the costs of fuel it was

found that central heating schemes drop into the middle group, neither the cheapest nor the most expensive. This, it is argued, means that central heating is becoming an increasing possibility for the small, cheap house. But, "as there is only a limited amount of anthracite available, the need is now for boilers that will burn other types of fuel as efficiently." The report maintains that the results demonstrate that in selecting heating systems the choice on economic grounds lies in most cases between the partial type of heating with the living room only warmed and full central heating with warmth in every room. "Background heating with topping-up is likely also to be economical when both water heating and space heating are provided by the same appliance."

The report is an interim one based on theoretical assumptions. It brings into vivid relief the value of insulation and the improved overall efficiencies of specially designed solid fuel burning appliances—in this case supplied with a fuel which the public could not obtain. It seems to us to have, in fact, a solid fuel "complex." We are sure that it would be entirely misleading for conclusions to be based on this interim report on standardized, but hypothetical, conditions regarding the relative merits of competitive forms of house heating equipment. The report should not be employed in advocacy of any one system of heating, though we can see that it may easily be used carelessly in this way. Therein lie danger and confusion.

COKE TRANSPORT SERVICE

NOT all of the millions of consumers of coke in the United Kingdom are altogether satisfied with the coke delivery systems operated by gas undertakings. That such customers are used to gas on tap must, of course, have an influence on their reaction to the delivery of coke. Gas is supplied, more or less pure, more or less free from sulphur, and is immediately available, *via* the tap, at the consumer's immediate desire. Coke is to be had, rationwise, more or less pure, often ill-screened, usually containing an inordinate quantity of foreign matter, and delivered "as and when." The current price of coke "as delivered" is in the neighbourhood of 93s. a ton. The ash and bats content of the coke may be between 20% and 30%. The burnable quantity of coke represents to the consumer a considerable budgetary item. Therefore, coke delivery service to the gas consumer should have prominence in the policy of any and every gas undertaking, and the aim should be to give the customer who orders coke a fixed date for its delivery. Whether the particular date of promised delivery is 10 or 20 days after booking of the order is, generally speaking, beside the point. What the customer asks for is a date of delivery. Seldom is the customer's request heeded. The gas undertaking commonly thinks it knows best.

From our experience of coke delivery it seems to us to make no difference whether the supplying undertaking is large or small, whether it has a big fleet of vehicles or a few runabouts, whether it does or does not work in amity with private owners of lorries. Certain facts are apparent. Gas undertakings to-day have to transport through the streets very large quantities of material in coke which has to be transported again, after being heated up in the home, to dump heaps. This is unfortunate and is not the fault of the gas undertakings. Transport of this incombustible material weighs heavily on the costs of motor haulage, which are no minor factor in the total costs of coke supply to the consumer. We have the greatest sympathy with the transport manager of any gas undertaking whose duties lie in minimizing the costs of coke conveyance from works to cellar or shed; and it is salutary that these difficulties should be defined, and altogether helpful that their solution should be both advanced and discussed. That is why we welcome the paper by Mr. H. M. Lawrence, Transport Manager of the Gas Light and Coke Company, which we give in abstract in our columns to-day. The paper was presented to the Eastern District of the Southern Association of Gas Engineers and Managers. It was an excellent paper. It covered transport in the gas industry generally and included many items other than the conveyance of coke. We suggest, however, that the nature of the paper lent itself more to presentation to a meeting of those primarily interested in the specialized field of transport and in the buying and maintenance of a large fleet of vehicles. And even after the successful meeting of the Southern Association, the whole of the proceedings at which we found enjoyable and illuminating, we are left wondering about the "assured date of coke delivery."

MISPLACED ENERGY

It is becoming evident that electrical energy should not be available at the switch at all times in the homes of this country. Speaking last week, Lady Reading, on behalf of the Ministry of Fuel Women's Advisory Committee, on matters electrical, explained the urgency of the "power problem." Housewives are to be asked to mind their switches. We are told that the "make-up" of their homes must be altered. "We shall," said Lady Reading, "have to give tips to housewives on how to cook without using so much power." According to reports in the national Press, one of the tips is to cook at times of peak load by means of a candle inside a flower pot. What credence can justifiably be attributed to these reports we do not know. The fact remains that, while Lady Reading talks, electrical heating appliances of high amperage are being bought by the housewife all over the country. Every day sees an addition to the domestic electrical peak load. We understand that squads of women have been organized to give effect to the Ministry of Fuel and Power's appeal to switch-off electricity in the home. What are these squads going to do? Are they going to squander energy in quizzing and edification at the doorsteps of the homes of the country, the while they may have added to the load by the purchase of an odd electrical appliance, maybe a kettle or an immersion heater? And is any harassed housewife of to-day to spare the candles she has in store for the domestic electrical cut-off for the doubtful purpose of cooking the diminutive family joint?

N.A.L.G.O. SAYS "NO"

The National Association of Local Government Officers has set its face against affiliation with the Trades Union Congress, after months of debate, by almost a two-to-one vote. The result of a ballot, reported to the National Executive on Dec. 5, showed 46,200 in favour of affiliation and 83,433 against. N.A.L.G.O. has 182,000 members, made up of local authorities' employees, officials in nationalized hospital and electricity services, and company-owned gas undertakings. Voting in the ballot was heavy with 71% of the membership returning ballot papers. The Executive of the Association last year advised members against affiliation but delegates to the conference in June this year decided to hold the ballot. The vote is a victory for those members who declared that an association of workers employed on governmental and public service work should remain apart from a political instrument like the Trades Union Congress. A sidelight on the decision is provided by the protest of the Civil Service Clerical Association, in October, against the T.U.C.'s part in the decision of the National Council of Labour to hold propaganda meetings in support of Labour Government.

THE LARGEST GAS COMPANY IN THE WORLD

The latest booklet issued by the Gas Light and Coke Company will give its readers some idea of the ramifications of the largest gas undertaking in the world. The Company is not only the father of an important industry, but is essentially modest—a contention borne out by the booklet. This chronicle, which is attractively presented and in accordance with Gas Light and Coke Company's standards, reveals the share each department has in the huge organization, and knits all into a pattern that is readily discernible. Efficiency has been the keynote throughout the history of the Company, and a table showing how it absorbed other undertakings one by one supports the picture that size and efficiency can go hand-in-hand. There are many living to-day with long memories of the fierce competition in the industry, when many of the smaller undertakings were hard put to eke

out an existence. The gloom caused by electrical competition was conspicuous, but time has shown that it was unfounded. The larger undertakings, moving like battleships, forged ahead and kept the smaller vessels in their wake, with results that were apparent in 1939. The Gas Light and Coke Company was the flagship of the fleet. The change from healthy competition under free enterprise to a controlled competition under State ægis is to come into being. What effects this translation will have, none can divine, but the industry has a great tradition, made great by such undertakings as the Gas Light and Coke Company; and this tradition will tell to good purpose in future years. We quote from the booklet: "Its (the Gas Light and Coke Company's) founders at the beginning of the nineteenth century had to contend with almost insuperable difficulties and prejudices before they could persuade Parliament to sanction their proposals." History has not repeated itself on this occasion, for now we have the State in the course of taking over that which they were unwilling once to permit—an industry that can be proud of its great achievements.

MORE AND MORE STEEL

While the Coal Board shivers in the blast of criticism from all sides and production from the mines still lags, steel output forges ahead and has now reached what the British Iron and Steel Federation calls "an important landmark in the industry's expansion." The "landmark" is to have produced a weekly average of over 300,000 tons and is indicated in production figures for November, just issued by the Federation. In itself, this is no argument either for or against nationalization, there being nothing to indicate whether the results come from the devotion of workers who want State control to their jobs, or from the directors who want private enterprise being determined to prove that the present organization can give better results than that proposed under the Bill now before the Commons. But the figures are worth recording. At an average weekly output of 303,000 tons, steel production to-day is at an annual rate of 15,756,000 tons. During the first nine months of the year output was at an annual rate of 14,752,000 tons and this figure, in conjunction with those of the two succeeding months, shows that the industry is more than likely to reach its objective of 14,500,000 tons for this year. Pig iron production continues to rise. During November it was at an annual rate of 9,636,000 tons, compared with 9,525,000 tons for October, and 8,627,000 tons a year ago. A spokesman of the Federation has stated that the higher output has been helped by the increase in pig iron production and a high rate of scrap delivery. In view of the seasonal decline which is expected over the Christmas period, the excellent November results are particularly satisfactory.

COAL BOARD ACCOUNTS

As a sort of supplement to the debate on the Coal Industry Bill in the House of Commons, discussed in these columns last week, the National Coal Board has published its accounts for the third quarter of this year. They show an estimated loss on the quarter's working of £372,943, despite a trading account profit of £3,417,057. This profit has been more than swallowed up by the interest on the Treasury's loan to provide the Board with working capital and the interim income payments to the former coal-owners. These charges make up a total of £3,850,000 for the quarter. The deficit is worked out thus: Colliery profits of £3,417,057, estimated profits of other ancillaries at £150,000, and other income, including investments and royalties from licensed mines, at £110,000, provide a total income of £3,677,057; against this is set £200,000 as compensation for loss of office, and the figure already given for interest and interim income. Taking the country as a whole, it cost the Board £2 6s. 2.2d. to produce each ton of coal in the third quarter of this year. The proceeds on each ton sold were £2 7s. 8.1d., leaving a profit per ton of 1s. 5.9d., comparing with a profit of 1s. 9.6d. a ton on the second quarter, and 1s. 6.8d. a ton in the first three months of the year. Allowing for the loss in the third quarter, the Board can show a surplus of £1,002,828 for the past nine months' trading. The accounts show that the Board is still relying on the high prices it can get for coal sold abroad for most of the profit it can show. When the price of coal at home was raised by 2s. 6d. a ton in January, export prices went up by 25s. a ton. The Board's deficit in the third quarter, comparing with surpluses in the first and second quarters, is ascribed mainly to the holidays. Expenditure on such items as roof supports, general stores, and repairs fell from £15,974,143 in the June quarter to £15,440,855 in the September quarter, but because production was less the cost borne by each ton of coal was about 3d. a ton higher.

At the moment the Board has three alternatives: it can carry on charging high prices for exported coal, in the face of increasing restiveness on the part of the buyer and of criticism from the Marshall Plan administration; it can face a domestic storm by raising prices to consumers in this country; or it can admit that it cannot carry on without aid from the Exchequer. Not one of these possibilities helps the Board in its bland opposition to demands for reform and the only sure way out for it would be greatly increased production: a rabbit it seems at present unable to pull out of the hat.

THE POULTRY SHOW

Probably no major London exhibition announces itself more stridently than the National Poultry Show, which on Dec. 7, 8, and 9 filled the National Hall at Olympia with such a concerted crowing, clucking, and gobbling that enthusiasts throughout the British Isles flocked to see this galaxy of perfection among our more popular feathered friends. The attraction afforded by the serried ranks of livestock was augmented by a considerable number of trade stands, and a special exhibit consisting of a number of "model" kitchens. Not the least interesting of these was an excellent kitchen sponsored by the British Gas Council, in which demonstrations of cooking egg and poultry dishes were held daily. The demonstrators were Miss Peggy Price, Head of the *Good Housekeeping* Institute Demonstration Department, Mrs. Hilda Whitlow, Cookery and Household Editor of *Homes and Gardens*, and Miss Helen Burke, a member of the Ministry of Health Sub-Committee on Domestic Equipment; they were introduced by Mr. Donald McCulloch, of B.B.C. fame. We have no doubt that these demonstrations met with an enthusiastic reception, but it is regrettable that the British Gas Council was tied to a kitchen exhibit, when excellent use could have been made of the various gas-operated brooders, incubators, &c., which provide a useful load in certain rural areas.

Personal

Mr. T. B. V. HIRST, formerly Chief Engineer to De La Rue Gas Development, Ltd., has asked us to state that he is no longer associated with that Company and with Thomas Potterton (Heating Engineers), Ltd.

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The retirement of Mr. F. ATKINSON, Chief Clerk of the Leeds Gas Department, after over 45 years' service, was marked on Dec. 9 by the presentation of a silver cigarette box on behalf of his many friends in the Department by Mr. C. S. Shapley, Engineer and General Manager. Mr. Shapley paid tribute to Mr. Atkinson's loyalty and good services through the years of his administration. The Engineer and General Manager-elect (Mr. N. G. Appleyard) expressed his admiration of Mr. Atkinson's capabilities, particularly in the field of local government procedure. Other tributes and good wishes for a long and happy retirement were made by Departmental heads and the presence of past Executives of the Department was proof of the esteem in which Mr. Atkinson was held.

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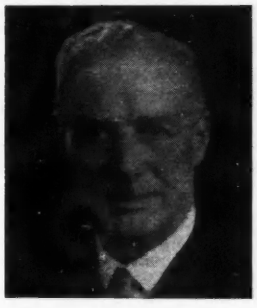
Mr. W. L. S. SPINKS, Controller of Gas Sales, is retiring from the staff of the Birmingham Gas Department on Dec. 31 after 43 years' service, 36 years of which were spent on the fittings and sales side. Mr. Spinks will be remembered by many as Hon. Secretary of the Gas Section of the British Industries Fair. As a member of the Institution of Gas Engineers, he served on several Committees, *e.g.*, Meters Committee, Education Committee, and Codes of Practice Panels. He has been a member of the Domestic Development Committee of the British Gas Council since its formation. He is succeeded by Mr. J. TUDOR REES, with the nomenclature of Manager, Fittings Department. Mr. Rees has successively held positions as District Inspector, Branch Superintendent, and Fittings Superintendent in the Department. He has been actively connected with the training and education of gas fitters in Birmingham for many years, and was for 15 years a teacher in gas subjects at Birmingham Central Technical College.



Mr. J. R. W. ALEXANDER, M.A., LL.B., General Manager of the British Gas Council, was elected a Vice-President of the Chartered Institute of Secretaries at its 57th annual meeting in London on Dec. 7.

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In connexion with the re-organization of the De La Rue group of Companies, Mr. J. E. COOPER, of the Gas Light and Coke Company's Research Department at Watson House, has joined the staff of Thomas Potterton (Heating Engineers), Ltd., as Technical Manager.

Obituary

The death has occurred of Mr. H. ZELLER, Distribution Superintendent of the Carlisle Gas Department. He had been in the service of the Department for 44 years, having been promoted to the position of Distribution Superintendent 14 years ago.

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The death has occurred after a short illness at Kingsbridge, South Devon, of Mr. T. A. DRIVER, who for 25 years represented Messrs. Abbott, Birks & Co., Ltd. During the last few years he had limited his territory to the South-Western Counties.

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We regret to record the sudden death on Dec. 2 of Mr. FRANK GREENHALGH, General Manager and Engineer of the Oldham Corporation Gas Department. Mr. Greenhalgh was 58 years of age, and started at Oldham in March, 1905, as a junior in the office. He proceeded through the works until, in 1927, on the retirement of Mr. Timothy Duxbury, he was promoted from Works Manager to Engineer and Works Manager for the whole of the undertaking. There were three separate works at that time, and he managed one of them. Mr. Ernest Parry had charge of the commercial side of the undertaking, and when Mr. Parry retired in 1943 Mr. Greenhalgh was appointed to take full charge. He was responsible for the designing of the Higginshaw Works, which is intended to be the central manufacturing plant for the whole of Oldham. The preparation for this centralization has been carried out in stages. In 1933 Prince George, the late Duke of Kent, opened the Higginshaw Works and a further opening this month is another stage in the centralization. When the plant at Higginshaw was opened in 1933 it was dealing with 4 mill. cu.ft. per day. At the present time it is dealing with 6½ mill. cu.ft., and retorts are being installed to bring the production up to 8½ mill. cu.ft.

Dr. H. A. Fells, Sheffield Industrial Fuel Consultant, addressed members of the East Midland Section of the Institute of Fuel at Nottingham Gas Theatre on Nov. 18 on modern gas furnace technique.

ELECTRICITY IN PARLIAMENT

In the House of Commons this month the Minister of Fuel and Power has been subject to a barrage of questions on electricity supply. Mrs. Middleton, of Sutton, who asks many questions on fuel generally, asked about what was happening in regard to the Severn Barrage scheme for hydro-electric production. Mr. Gaitskell replied that the construction of a tidal model is an essential preliminary to further consideration of the project. The construction of this model and the conduct of the experiments will be under the direction of the Hydraulics Research Board. Whereupon Mrs. Middleton asked if Mr. Gaitskell could given any indication of the further period that will be necessary to get the advice of experts on the subject.

Mr. Gaitskell: I should think it would take at least another two years before we can get any final decision.

Mr. Peter Freeman, of Newport, joined in the argument " in view of the fact that these proposals vitally affect South Wales." Mr. Gaitskell pointed out that the project would cost at least £60 mill. and would take eight years. They ought to be careful about what they were doing before they started.

Mr. A. C. Bossom, of Maidstone, switched the discussion to district heating. He asked the Minister if estimates were obtained to enable the 25 new generating stations which are now being built to use their waste heat for this purpose. Mr. Gaitskell said that no such estimates were obtained in connexion with these generating stations, the plans for which were made at least two years ago.

Mr. Bossom: Is it not an absolute scandal, when we are investing this tremendous amount of money in the provision of 25 new generating stations, that if we had only taken the trouble to get a few estimates we could have made use of this waste heat for district heating on a wide scale in many places ?

Mr. Gaitskell: I would not agree with the facile conclusions of the hon. Member, but if it was a scandal it is not one for which the Government have any responsibility.

The Minister was asked what was the estimated electricity generating capacity available at peak for this winter as compared with last year. To this Mr. Gaitskell replied that the available capacity of the stations now controlled by the British Electricity Authority was approximately 9,380,000 kW. in January, 1948, and is expected to be approximately 9,707,000 kW. in January, 1949. The increase of capacity is less than was estimated because more plant (to the extent of some 200,000 kW.) will have to be taken out of service for repair and less new plant (to the extent of between 500,000 and 600,000 kW.) will have been commissioned than was expected. Lack of co-ordination in the placing of orders and absence of standardization, to a large extent inevitable while responsibility was diffused, had held up progress.

Mr. C. W. Dumpledon, St. Albans, asked whether the estimated increase of 1,450,000 kW. for next year was likely to be reached.

Mr. Gaitskell: I should think it most unlikely.

Members of the Yorkshire (West Riding) Regional Joint Industrial Council for the Gas Industry were recently entertained to luncheon by the Lord Mayor of Sheffield (Alderman W. E. Yorke, J.P.), Chairman of the Regional Council for the current year. The luncheon was followed by a meeting of the Council, at which the Lord Mayor welcomed the members to Sheffield and Mr. G. E. Currier, M.B.E., Vice-Chairman, responded. Front row (left to right): J. D. S. Highman (District Secretary, National Union of General and Municipal Workers); G. E. Curirer (Bradford); the Lord Mayor; R. M. Stevenson, N.U.G. & M.W. (Secretary, Employees' Section); R. Halkett, Senr. (Sheffield); John Heys, C.B.E. (Town Clerk). Others in the group are V. J. J. Siddons (Rawmarsh), R. Halkett, Junr. (Sheffield); N. Hudson (Mirfield), A. McDonald (York, Harrogate Group), C. S. Shapley (Leeds), J. MacLusky (Halifax), W. T. Scott (T. & G.W.U.), C. Mountain (T. & G.W.U.), E. R. Busby (Assistant Secretary, Employers' Section), H. E. Bloor (York), Councillor H. E. Matthews (N.U.G. & M.W.), F. N. Booth (Keighley), Councillor J. W. Wallbanks (N.U.E.F.M. & E.W.), C. L. Davies (Secretary, Employers' Section), H. Jack (Ilkley); H. Singleton (Huddersfield), J. W. Fisher (N.U.G. & M.W.), Councillor F. Sykes (N.U.G. & M.W.), and H. B. Taylor (West Riding Group).

News in Brief

Christmas Cake Decoration was the subject of a recent demonstration by Miss H. Zvegintzov, of R. & A. Main, Ltd., at the third meeting of the newly-formed branch of the Women's Gas Council at Newark. There was an excellent attendance, and interest was shown in the different types of decorative icing used.

In the October issue of "GAS" (p. 34), the photograph of Mr. Lewis Bain, of Greenock, was published in error in connexion with the Presidential Address of Mr. W. Brown, of Falkirk, to the Scottish Junior Gas Association (Eastern District). Mr. Lewis Bain is President of the Western District of the Association, and his Address was published in the November issue, p. 128.

The Trade Statistics for October, 1948, just issued by the Department of Industry and Commerce in Eire, show imports of 22,242 tons of gas coal, valued at £107,006, as against 8,747 tons, valued at £26,203 in October, 1947. This brings the total of these imports for the first 10 months of 1948 to 246,637 tons, valued at £1,090,294, compared with 99,194 tons, valued at £328,110 in the corresponding period of 1947.

Mr. Alfred Robens, M.P., Parliamentary Secretary to the Ministry of Fuel and Power, Mr. David Fulton, Chairman of the Scottish Board of the British Gas Council, and Mr. R. D. Keillor, Chairman of the Industrial Gas Development Council, were speakers at a conference on fuel economy and efficiency organized in Glasgow on Dec. 2. The conference made a strong point of eliminating midweek sport in order to maintain production and services at full pressure.

The Institute of Welding (North London Branch) held a meeting at the Regent Street Polytechnic on Nov. 18 at which a lecture was given by Mr. O. Bondy, A.M.I.C.E., M.I.Struct.E., on "Welded Structures, Past and Present." Mr. Bondy said that for one item of war equipment, the Bailey bridge, about 700,000 tons of high tensile steel were fabricated by welding, and millions of tons of steel went into welded Liberty ships. Failures occurred in a small proportion of these, and also in welded bridges, but failures were perhaps the most effective stimulus to progress and lessons from extensive research into their causes were invaluable. There was unlimited scope for structural welding in this country.

The Film, "Noose," which had a two weeks' run at one of the largest cinemas in Coventry, was publicized by the Coventry Gas Department in an unusual way. The film lends itself to a jig-saw competition and the cinema manager asked the Department if they would be responsible for the entire exploitation. Cut-outs in jig-saw fashion were made and pieces distributed throughout the city centre shops with the caption "This is number one, &c., of the jig-saw competition which is being held in conjunction with the Empire Cinema, in connexion with the film 'Noose'... they are all shown as this one in other windows." In turn the Gas Department display made mention of the competition. The tie-up resulted in a clear rise in sales.

Concern was expressed at Campbeltown Town Council meeting at a 10 mill. cu.ft. gas loss which was mounting. Bailie C. Campbell, Gas Convener, told the Council that he regretted that an expected improvement had not taken place and that there was still a considerable difference between gas made and accounted for. Up to the end of the last financial year, May 15, the amount of gas made was 63,999,000 cu.ft., with 53,849,500 cu.ft. of gas accounted for, showing a loss of 10,149,500 cu.ft., equal to 15.85%. It was decided that at the end of the next survey period the Burgh Chamberlain should prepare an estimate to enable the loss to be determined over a period. If this figure shows no improvement, the Council has agreed that the Ministry of Fuel and Power should be asked to arrange for an expert to investigate. Mr. A. T. Sinclair, Engineer and Manager, gave three probable reasons for the loss—leaks in the gasholder, leaks in the mains, and the use of gas for testing pipes in housing schemes. He hoped that the figures for May, 1949, would show that the loss would be no more than 10%.

Members of the Bell Green Townswomen's Guild (Coventry) visited the Foleshill Road, Coventry, works of George Wilson Gas Meters, Ltd., recently. They were interested in the various stages in the assembly of a gas meter, and the care and attention paid to each stage. Particularly, were they interested to learn the number of times the prepayment mechanism was tested and examined, and this mechanism appeared to them extremely important, as they were all anxious to see and understand what happened to a coin after it was inserted in the meter. The various testing stages also provided fascinating study. The guests were entertained to tea by the Directors, and, in the absence of the Chairman, Mr. F. C. Wilson welcomed the visitors and gave a brief outline of the activities of the Company since its inception in a small way in 1904 with half a dozen employees. He pointed out that to-day the firm had branches in London, Manchester, Blackpool, Wolverhampton, and an office in Leeds, while in Jarrow the main production unit of the firm had recently been installed in a modern and pleasant factory.

At the Invitation of the Isle of Wight Gas Association an instructional talk was given to members recently in the Ryde Gas Company's lecture hall by Mr. G. F. Jenkins, Sales Manager of Main Water Heaters, Ltd., assisted by Mr. Ean Andrew, Technical Representative. The full range of Main heaters was dealt with and an interesting discussion followed.

Parliament Has Approved Special Orders proposed to be made by the Minister of Fuel and Power, under the Gas Undertakings Acts, 1920 to 1934, on the application of the City of Stoke-on-Trent; the Wellington (Salop) Gas Company; and the Brough Elloughton and District Gas Company. In each case the draft Order was presented to the House on Oct. 27.

A New Batch, the second to be prepared, of standard sand for the determination of the agglutinating value of coal according to British Standard Specification No. 705 is now available. It has been prepared by the Fuel Research Station, D.S.I.R. The sand will be supplied in 7 lb. tins, costing £1 3s. (post free in the United Kingdom). Applications should be addressed to the Director, Fuel Reasearch Station, Blackwell Lane, Greenwich, London, S.E.10.

At the Annual Dinner of the Leamington Chamber of Trade, the Mayor (Councillor G. Purcell) presented awards for the best floral decoration of business premises during the year. The Challenge Shield for hanging flower baskets was presented to Mr. R. S. Ramsden, Director, General Manager, and Engineer, of the Leamington Priors Gas Company. Making the award, the Mayor said that this was an example of "what private enterprise could do" and took the opportunity of saying what efficiency, courtesy, and consideration had always been extended to Leamington gas consumers by the staff of the Company who, for fifty years, had set a splendid example.

Design Fair, which has already been seen by over 220,000 people in the provinces, is to pay a visit to London from Jan. 3 to 29, when it will be housed at the Whitechapel Art Gallery. The aim is to interest the public in good design. Organized parties of adults, students, and school children, are particularly welcomed. Teachers and organizers should apply to the Director, Whitechapel Art Gallery, London, E.1. Talks will be given at the Fair at frequent intervals. Design Fair was shown first to the public in Cardiff, in April, 1948. It has also been seen in Manchester, Birmingham, Preston, Bolton, and Sheffield. Next year, its tour includes Stoke-on-Trent, Nottingham, Norwich, Bristol, Southampton, and Bradford.

Glasgow Corporation rejected a decision of its Gas Committee on Dec. 9 that the Ministry of Fuel and Power should be asked to open Coatbridge Gas-Works and consider the formation of a gas grid for the immediate surroundings of Glasgow or alternatively for the West of Scotland. Mr. L. Blanche, who advanced the proposals in Committee (where they were supported) and in the Council (where they were lost) urged the need to consider the dangerous position of the gas undertaking which was 5 mill. cu.ft. per day short of its maximum requirements, urged the need to take steps now to create a gas grid rather than wait till gas was nationalized. Opposition was based on the fact that both projects had already been discussed and that they should now go before the Scottish Gas Board.

Diary

Dec. 16.—**Midland Junior Gas Association**: Film evening, Wolverhampton.

Dec. 17.—**London and Southern Junior Gas Association**: Film: "Atomic Physics," following an introduction by H. S. Groom, M.A.(Cantab). Gas Industry House, 7 p.m.

Dec. 20.—**London and Counties Coke Association**: Finance Committee, 11 a.m.; Executive Committee, 11.30 a.m., Gas Industry House.

Dec. 21.—**Industrial Gas Development Committee.** Gas Industry House, 9.30 a.m.

Jan. 12.—**B.G.C. Domestic Development Committee**: Technical Sub-Committee, 10.30 a.m.; Main Committee, 2.30 p.m., Gas Industry House.

Jan. 25.—**Southern Association of Gas Engineers and Managers (Eastern District)**: "Ten Years' Experience of a Two-part Tariff," J. E. Davis, F.R.I.C., Principal Technical Officer, and R. F. Layton, Tariff Officer, South Metropolitan Gas Company. Gas Industry House, 2.30 p.m.

NORTH OF ENGLAND GAS COKE ASSOCIATION

The Annual General Meeting of the North of England Gas Coke Association was held at the County Hotel, Newcastle-on-Tyne, on Dec. 2. The Chairman, Mr. F. L. Scaife, Engineer and Manager, Stockton Gas Department, welcomed the members, and on their behalf, congratulated Mr. E. Crowther, General Manager and Chief Engineer, Newcastle and Gateshead Gas Company, on his appointment as Chairman of the Northern Area Gas Board. In wishing him every success Mr. Scaife added that the appointment was well deserved and it had given pleasure and confidence to all connected with the gas industry in the Northern Area. He also referred to Mr. Crowther's election to the Presidency of the Institution of Gas Engineers in one of its most important years and stated that all were satisfied that its destinies were in the hands of one who could fill the office with distinction and dignity.

The Chairman said this would probably be the last annual general meeting of the Association in its present form but emphasized that it had fully justified its existence by co-ordinating and safeguarding the interests of the gas coke industry in the area for a period of some 10 years. But for the intervention of the war it would have implemented its objects with even greater effect. He paid tribute to the work of Mr. S. Black, Secretary of the Association since its inception, who was also responsible for the success of the programming of supplies in his capacity as District Coke Representative, Ministry of Fuel and Power, and he was now proving his worth in connexion with the exports of gas coke.

Mr. E. Crowther responded and thanked the Chairman and members for their good wishes. He stated that both he and the Area Board would require the support and confidence of the gas engineers and managers for the success of their operations and he knew he could rely on these. He added that the Area Board had not yet been appointed and he was therefore not in a position to outline its policy but there was no doubt that the valuable work of the Association would have to be continued in some form or other in order to ensure that the consumers and the Board should derive the fullest benefit from coke and other products of carbonization.

Mr. S. Black acknowledged the thanks of the Chairman and members for his efforts and in turn thanked them for their co-operation and support. He stressed the need for all concerned in the gas coke industry to develop local markets but sounded a note of warning that the successful development of these markets was dependent on the quality and grading of the coke and on its selling price being competitive. The interest now being taken in smoke abatement and the fact that those concerned in the building of houses were installing smokeless fuel appliances provided a golden opportunity to increase sales and secure a stable market for gas coke. The Association could be proud of its achievements and it would hand over to the Gas Board a complete picture of the coke market in the area which would be invaluable to a sales organization.

The Chairman read the annual report, which showed that the disposals of gas coke to consumers in the area totalled 216,000 tons for the year. The exports from March to date totalled 78,000 tons. The report was adopted and the following officials were elected for the ensuing year:

Chairman: F. L. Scaife (Stockton). *Vice-Chairman*: J. G. Aitken (Carlisle). *Hon. Secretary*: S. Black (Newcastle). *Hon. Auditors*: J. W. Pallister (Middlesbrough), and W. N. Battersby (Lakes). *Executive Committee*: F. L. Scaife, J. G. Aitken, E. Crowther, C. C. Walmsley, R. H. Duxbury, H. D. Lees, J. R. Gledson, G. L. Wearing, H. Galleway, A. Field, T. H. Large, and T. Crowdy.

The meeting concluded with a vote of thanks to the Chairman for his handling of the proceedings and for his work and guidance during the year.

EXHIBITION OF VISUAL AIDS

A daily showing of English and foreign films and film strips will form part of a comprehensive exhibition of visual aids on industrial design to be held from Jan. 3 to 29, at the Murray House Exhibition Hall, Vandon Passage, Petty France, London, S.W.1. Since the formation of the Council of Industrial Design four years ago, the Information Division has been developing and extending its stock of material of all kinds designed to inform the public in the principles of good design.

Visual aids include films, film strips with recorded commentaries on gramophone records and with lecture notes, wall cards, books, loose and mounted sets of photographs, illustrated design folios, and portable box exhibitions. The Council's new transportable exhibition stands which can be dressed to suit various purposes will be on show for the first time. Two or three of them make an effective small exhibition, and they can be borrowed free of charge, except for return transport charges. The other material can be bought, hired, or borrowed.

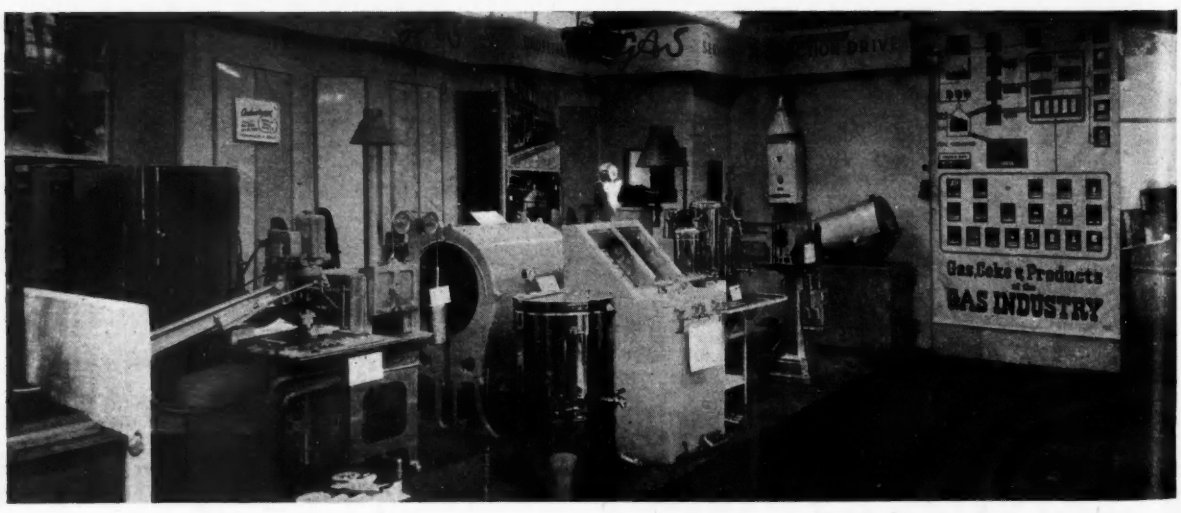
All who can make use of any of the material—teachers, lecturers, retail trade staff training officers, organizers of clubs and voluntary bodies, and others—are invited to see the exhibition.

INDUSTRIAL EXHIBITION AT SWANSEA

Swansea was chosen as the first of six selected towns at which exhibitions are to be held under the auspices of the Cabinet Economic Committee in furtherance of the production drive, and the exhibition was opened by Mr. Douglas Jay, M.P., Economic Secretary to the Treasury. The Swansea Gas Light Company staged an exhibit designed to emphasize the important link provided by gas between the basic and ancillary industries. Subsequently, the gas undertakings of Aberdare, Brecon, Bridgend, Carmarthen, Gowerton, Llanelly, Llynvi Valley, Neath, Pembroke Dock, Port Talbot, and Tawe Valley associated themselves with the exhibition. All exhibits on the stand were "live" and were chosen to illustrate industrial purposes for which gas is used, particularly in local industries, examples of the products of which were also on show.

In addition to the stand proper, six documentary gas films were shown daily in a cinema within the hall. The exhibition attracted an attendance of 77,969; the gas films were witnessed by audiences aggregating over 8,000.

As a whole, the exhibition had distinction and dignity. The gas stand and gas films were the subject of much favourable comment, and the undertakings responsible for the exhibit—and the manufacturers whose ready co-operation ensured the success of the stand—have reason justifiably to feel proud of the venture.



The stand arranged by the combined gas undertakings of South Wales, specially designed to illustrate the industrial uses of gas.

PROPOSED EXTENSIONS AT OXFORD

PROPOSALS submitted by the Oxford and District Gas Company for the extension of the existing gas-works were opposed on town planning grounds by the City Council at a public enquiry held last May. As an alternative the City Council proposed that the extension should be carried out on a site at Cowley, an industrial suburb of the city. At its meeting last week the City Council received from its Joint Parliamentary and Planning Committee a report indicating that the Council's proposal had been turned down by the Ministry of Town and Country Planning.

The reported stated: "The Minister sympathizes with the Council's wish to secure the ultimate removal of the gas-works from their present site, but in view of the additional capital expenditure and the considerable quantity of materials, especially steel, which would be needed if the necessary plant and buildings were located at a distance from the existing works, he does not feel justified at the present time in pressing for this course to be adopted.

"He agrees, however, that some modification of the order promoted by the Gas Company is desirable to secure that the Council's future plans for redevelopment will not be prejudiced.

"The Minister of Fuel and Power has accordingly invited the Company to submit a revised draft order providing for an increase in the capacity, and consequently in the length of the proposed retort house to be erected on the site immediately south of the existing works, this increase in capacity being designed to replace the existing retort house on the north bank of the river, the site of which is to cease to be used for gas purposes in 10 years' time, or such other period as the Minister may direct."

The report added that it had been ascertained that the Southern Gas Board, to be set up under the Gas Act, would be informed by the Minister that he recognized that there was much to be said for the view that the gas-works should ultimately be removed from its present site, and it would be advised to investigate the possibility of doing this "within the next 30 years or so." The question of the erection of the proposed new holder on the south bank has also been deferred for the consideration of the Board, but would, in any event, require the consent of both Ministers. The report ended that as the modification of the Order fell far short of the Council's original decision opposition to the Order was being maintained.

When the report was submitted to the Council, a motion to refer it back for reconsideration with a view to rescinding a resolution passed by the Council in June was defeated. The June decision was that in the event of the Ministry of Fuel and Power confirming the Gas Company's Order as deposited, or with modifications not ensuring the removal within a reasonable time of the works from the present site, the Town Clerk should be authorized to take all necessary steps to maintain the Council's opposition to the Order on its submission to Parliament.

Alderman Lady Townsend, Chairman of the Joint Committee, insisted that the matter of the improvement of the city was of international importance. The Joint Committee had discussed the Ministry's ruling at some length and in detail, and it was only implementing the decision of the Council.

In opposition to the Joint Committee's recommendation it was argued that the removal of the gas-works to Cowley would cost hundreds of thousands of pounds, and compensation would be payable by the Corporation. Already the enquiry had cost £2,000, and if a miracle happened and the retort house was put up at Cowley the price of the extension alone would be £63,000 a year for 25 years.

In an appeal to the Council to support the Parliamentary Committee, Alderman Smith said if the gas-works were tied down to that particular site for generation after generation Oxford could never be a place of beauty. "We have not only a duty to the people who live here at present, but a duty to their children," he said, "and so let us rescue it, and make this gem in the centre of England look as it ought."

Councillor Brewer, who said the question had split Conservative, Liberal, and Labour members, supported the Committee's action, but the fact that two Ministries had agreed made him feel that they were up against a stiff problem.

Alderman Lady Townsend said the committee had agreed to carry the matter to its logical conclusion and she considered it would be the height of feebleness and folly to stop at that moment.

The Committee's recommendation was adopted.

Councillor H. M. Lodge, Chairman of the Oxford and District Gas Company, is reported to have described the decision of the Ministry of Town and Country Planning (doubtless agreed by the Ministry of Fuel and Power) as "a triumph of common sense." In a local Press interview he commented that the decision accepted the Company's view, put forward in evidence at the public enquiry, that the river was the natural boundary for any replanning of St. Ebbe's.

"Indeed, at one of the earliest conferences, the Company offered to remove the works from the north side of the river, but the offer was rejected out of hand; the planners wanted the removal of the whole works or nothing. The Minister has adopted the Company's contention that the economic position of the country does not permit of the additional large drain on labour and materials involved in building the extensions at Cowley, but he has accepted, in effect, the Company's offer to build the new holder at Cowley, subject to compensation.

"I hope the opponents will now accept the two Ministers' joint decision, and enable the Company to place the orders for the works, which, of course, will fall to be completed by the new Southern Area Gas Board. I have done my utmost for two years past to warn the citizens of Oxford of the extremely narrow margin on which the gas-manufacturing plant is working. The opposition counsel, at the enquiry, made light of these warnings; but if a breakdown should occur, the effect would be disastrous and wide-felt. The blame, however, would not lie with the Company, nor with the new Area Board, which will succeed to a position for which the City Council must shoulder the primary responsibility."

WALSALL DEVELOPMENT PROSPECTS

Accompanied by Dr. F. H. Moore, of the Ministry of Fuel and Power, Alderman W. Lewis, Chairman of the Midland Electricity Board, and other Ministry and Board officials and representatives of neighbouring gas undertakings, the members and officials of the Walsall Town Council carried out on Nov. 23 what may be their last official inspection of the municipal gas undertaking before it is transferred to the ownership of the West Midlands Area Gas Board next year.

The inspection was followed by a luncheon at which the Mayor (Councillor **F. W. Evans**) proposed the toast of the gas undertaking and briefly reviewed its 122 years' history. The gas supply rights of the Birmingham and South Staffordshire Gas Light and Coal Company in the town (which were at that time controlled by the Birmingham Corporation) were purchased by the Council in 1876. About that time Walsall was opposing a Bill promoted by the Birmingham Corporation. A note written during the negotiations and signed by Joseph Chamberlain, then Lord Mayor of Birmingham, indicated that Walsall agreed not to proceed with its opposition and Birmingham agreed to sell the Walsall part of the gas undertaking for £1,300 a year.

After reviewing the progress of the undertaking, the Mayor said he was looking forward to the construction of a new gas-works at Pleck during the next few years which would be unrivalled in the country.

Alderman **H. Hucker,** the oldest member of the Gas Committee, responding to the toast, said the progress of the undertaking in recent years had exceeded the Committee's wildest dreams. In 1943 it was thought that the plant had reached its maximum output but the latest figures showed that the supply of gas was 90% higher than in 1940, and that the Department was in a better financial position than ever before. This happy state of affairs was due chiefly to the leadership and ability of Mr. A. Allen, General Manager and Chief Engineer, and the loyalty of those who worked with him. He particularly recalled the loyalty of the gas workers during the fuel crisis when coal stocks fell to four days' supply of gas.

Councillor **W. Kelley,** Chairman of the Gas Committee, proposed the toast of the visitors.

Dr. **F. H. Moore,** of the Ministry of Fuel and Power, responding, said he had been impressed with the amount of space which surrounded the Pleck works. It was clear that there was ample room for expansion. He could not prophesy what the new Area Gas Board would do, but to his mind the site seemed ideally situated for the erection of a new Midland gas-works for the industrial area between Birmingham and Wolverhampton, and the Area Board might well find it a suitable link in their system. Both the Town Council and the Ministry had approved a plan for extension of the works, drawn up by Mr. Allen and the Committee in 1946.

The undertaking's output increase of 50% since 1944 without additional plant was a great chievement, and he was certain that when the Area Board took over they would find the works in a first-class condition. He realized that many members of the Gas Committee would view the handing over of the concern with sorrow, but he assured them that Consultative Councils would be set up and the representation of the local authorities would be pretty strong. If they had men of the calibre of the members of the Walsall Gas Committee on those Councils he was sure the interests of the consumers would be well looked after.

A vote of thanks to the Chairman, proposed by the Deputy Mayor (Councillor **A. W. Percox**) was seconded by Alderman **W. Lewis,** Chairman of the Midland Electricity Board, who said he hoped the transfer of the gas undertaking from the Corporation to the State would go through as smoothly as did the electricity change-over.

Edinburgh Corporation has agreed by 33 votes to 17 to increase the gas rate by 0.6d. per therm, a 5% rise on existing charges, as from Feb. 15 next. Treasurer Miller said that the increase was necessary largely because of the increased price of coal. Opposing the increase, Mr. Robert Bell said its effect would be to strengthen the reserve fund to be handed over to the Government.

A REPORT ON HOUSE HEATING
EXPERIMENTAL RESULTS AT ABBOTS LANGLEY

FIRST results of trials on house heating systems, carried out in 20 semi-detached houses at Abbots Langley, Hertfordshire, by the Building Research Station of the Department of Scientific and Industrial Research, were discussed at a meeting at the Royal Institute of British Architects on Dec. 7. The trials, held in specially-built, insulated houses, were first carried out by a technical staff performing the normal routine of a household so far as heating demand was concerned, and now by instruments while tenants are in occupation.

The programme began with a film, " Heating Research in Houses," produced by the Central Office of Information for the D.S.I.R., showing how Mr. Richard Eve and Dr. D. J. Weston, the architect and scientist in charge of the work, and their staff went about the tests. The film suggested that the building of new houses gave a great opportunity to architects to install efficient heating systems and explained that the trials, claimed to be the only ones of their kind in the world, were designed to find out what heating system gave the best results.

For six months the tests, supervized from an office on the site, were carried out by technicians who measured temperature changes, air flow, heat losses, radiation intensity, and other factors while running the appliances installed in the houses as would be done by a normal family. Similar in external appearance, the houses differed internally in that some had a " through " living room, others two ground floor rooms in addition to the kitchen.

After six months tests, a mass of data has been got together, some of which has now been analyzed as a paper in the *Journal* of the R.I.B.A. The houses were then redecorated, new appliances installed where old ones had failed, and selected tenants from the local Council's list interviewed and moved in, instruments carrying records from the houses to the site office taking the place of technicians who had previously done the measuring. Tenants paid a standard rent and were allowed as much fuel as they could pay for, this being supplied in tested grades. This second stage of the experiment is still progressing.

The film over, Mr. Eve gave a short address providing certain supplementary data to that given in the published report and in the film. He explained that the first report on the trials had been concerned with the economics of heating systems, because the Egerton Report had stressed the need for such information to the extent that this might be regarded as the *raison d'etre* of the trials.

To complete the picture, it was necessary to go back a step. There were 19 heating systems in the houses, divided into three groups. The first group, which they called the " partial system," had only open fires and the usual cooking appliances. The second group, called the " two-stage system," warmed the house by convected warm air, provided hot water which in the exception was distributed through radiators, and " topped up " by gas or electricity. The third group, " whole-house heating," provided a constant temperature of 30° F. above that outside the house.

The main difference in the temperatures of the rooms of the houses was between the bedrooms and the living-room. A surprising fact had been observed in that the houses did not cool down overnight to the degree expected. That the houses were slow to cool down was due to the standard of insulation, which was better than that usually found. The values they had arrived at confirmed very closely those of the Egerton Committee. Doors were only opened to allow the staff to go about and windows were kept closed. Measurements on an average over the houses over the whole of the heating season gave figures of ventilation of the type required by the Egerton Committee.

In designing the houses they had decided that they should be built economically and they had had them appraised by the Ministry of Works as if 50 of them were being built on a site. Costs were judged on a basis of those applying in April, 1948, and these data were used in basing charges to tenants when they moved in. Builders' profits were not included in the costs.

Economics of " Whole House " Heating

Mr. Eve then briefly showed an analysis of the costs involved in the different heating systems on the basis of a local government loan amortized over 60 years at 2½% interest. " Whole-house " heating and " partial " heating were shown to be in competition, but the " two-stage " system appeared to be " entirely out of court." In all but two of these houses the hot water was provided by separate appliances, and it was found that experiments were needed to find new principles in this group; savings, for instance, might be made by using hot convected air to heat one of the bedrooms and by using gas or electricity in the second. The report pointed out that no appliance had failed to provide the hot water recommended by the Egerton Committee,and the cooking load was assumed to have given satisfactory service between the different appliances.

Mr. Eve then pointed out that one of the greatest contributions architects could make to fuel economy was by putting the flue inside the insulated shell of the house and not outside it. He reminded his audience that this was only an interim report on an experiment that would be continued for many years and only dealt with one aspect of the service.

The long discussion which followed Mr. Eve's address was concerned most with the architect's aspect of the findings, and several speakers spoke of the contribution these findings could make, when applied, to both fuel economy and health. Many speakers agreed that background heating appeared to be a non-starter as far as the tests went, and a number of points were raised in regard to ventilation. The system adopted in the houses of ventilation through a vent in the roof was commended as much better than the method of a grille in the wall, " which was usually papered over because it was unsightly and caused a draught."

Comparisons were made between heating practices in this country and overseas. Whole house heating, one speaker claimed, was a necessity and not just a fad. In other countries, architects automatically heated houses, whereas here they asked, " Shall we heat it or not ? " We had become accustomed to designing houses against draught; yet with a proper heating system, it should become possible to have a very much more open design, so that people could live in the whole house and not just concentrate in one room.

Another speaker questioned the need for over-night burning appliances at all in a properly insulated house. The value of good insulation had been shown at Abbots Langley, where there was only a drop of from 5° to 7° internal temperature during the night.

A Possible Danger

Mr. C. A. Masterman, a member of the Egerton Committee, remarked that the very ambitious trials at Abbots Langley were an outstanding example of applying academic work to something very practical. He protested strongly against anyone coming to any conclusions on the basis of the report as so far presented, as it was only an interim one, and he said there was a danger of the Egerton Committee standards becoming what was thought to be typical. He wanted to make it clear that the Egerton standard for hot water supplies was the maximum of which an appliance should be capable. The figure of merit for an installation should be what the user required. If he did not want the heat that was provided, the system was inefficient.

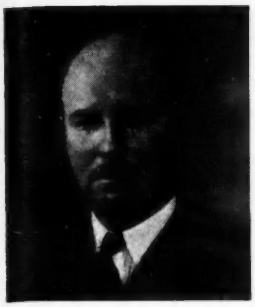
Another speaker reminded the meeting that it was possible to insulate existing houses and said that the Ministry of Fuel and Power were taking steps recommending people to insulate their houses to save fuel. Others touched upon questions of labour-saving appliances and the amounts of fuel used.

Mr. Eve replied briefly to the points raised. He pointed out that the Building Research Station was not advocating any one system of heating but was trying to find the facts. The best system for measuring human comfort was by human beings, and this they were now trying to do by having their houses occupied while continuing the tests.

Dr. Weston replied to scientific points which had been raised. He said he was afraid that many speakers were making snap decisions on the results so far published and reminded them of the terms of reference on which the trials were conducted: " to provide information on which executive decisions may be based."

WASTE HEAT RECOVERY

" It has been authoritatively stated that not more than 15 to 20% of the energy of our coal supplies is usefully employed. . . . Even an additional 5% improvement would mean a saving in coal mined of between 50 mill. and 70 mill. tons a year." Sir Ernest Smith makes this comment in introducing *Waste Heat Recovery from Industrial Furnaces* (Chapman & Hall, pp. 384: 35s.), a treatise based on a series of papers presented to the Institute of Fuel. This volume ends the second of two studies carried out by the Institute, the first covering industrial insulation as a means of conserving fuel, and the second devoted to means whereby the heat leaving industrial furnaces in the flue gases may be recovered and made to perform useful work. Approaching the study of means whereby this may be achieved, the Institute decided to concentrate on regenerators and recuperators, and on boilers of the type which use the waste heat for raising steam. The team taking part in the study was composed of leading authorities, a fact which is reflected in the quality of the nine papers here presented. The contents cover total, recoverable, and returnable heat in combustion gases, heat transfer data, a study of the factors governing regenerator design with special reference to coke ovens, a paper on tubular metallic recuperators, waste heat boilers in general, and studies of heat recovery in the metallurgical and glass-container industries. Of special interest to the gas industry will be the study " The Utilization of Waste Heat in the Carbonizing Industries," by Dr. J. G. King and Dr. F. J. Dent, a 50-page section which covers various types of retort setting, water gas processes, and coke ovens. It includes an appendix by Dr. S. Pexton on the balance of fuel, steam, and power in carbonizing plants.



THE PLACE OF TRANSPORT SERVICE IN THE GAS INDUSTRY*

By H. M. LAWRENCE, M.A., M.I.Mech.E. F.R.S.A.,

Transport Manager, Gas Light and Coke Company

WHEN was asked to read a paper on transport to the Southern Association of Gas Engineers and Managers, the first difficulty I encountered was to find a title which would neither be too large and clumsy, nor so over-simplified as to be inadequate for the number of varied activities which I feel it essential to describe to give a true picture. You will note that the word " service " appears in the title. I hope to bring out the point that there is in transport scope for ingenuity and resource, and also that it should not necessarily be treated as a Cinderella among the various services which go to build, operate, or maintain the industry. I feel, and naturally feel very strongly, that it is not to be regarded as just something which can be turned on at the tap, and which goes on running without a certain amount of brain and attention being devoted to it in the background. Pursuing the same analogy, I should also like to make the point that one cannot suddenly shut off the tap in the line without incurring water hammer and stress all the way back to the source. In this, of course, is wrapped a plea for the customer to co-operate with the transport manager by giving him as much notice as possible of increase or decrease of requirements.

The transport organization should not be just static and supine; it should be ever seeking, by close co-operation with its customers, new ways which can be of service in saving time and labour. Further, by devising new methods or machines, it should stimulate the customer's own imagination to help himself further by making use of the services which can be offered.

The period since the war has been devoted to a struggle to keep services running, with the disappointments and delays in deliveries so well known to engineers, and to making do with anything that one could lay one's hands on. As a consequence, so much less time and energy can be devoted to real refinements. Many figures obtainable now, therefore, are of no real value in assessing the needs of a peace-time fleet, and I propose to keep them to a minimum.

However, I think that the following breakdown of the type of work done under normal conditions and now would be of interest. This is calculated taking the ton-mile figure for all sizes of vehicles as approximately the same, and will serve as an indication.

	1939	1948
Coke	34%	28%
Works, including tar spraying and delivery..	18%	39%
Stove and meter department	16%	3%
Sales and fittings and distribution	16%	12% and 8%
Cars and coaches	8%	6%
Miscellaneous	6%	1%
Stores	2%	3%

Coke Delivery

It is difficult to tell yet how the coke delivery trade will move when the bonds of rationing are removed, but just before the war the daily coke tonnage delivered, if a 48-hour service was attempted, was becoming more and more sensitive to weather conditions, and in our case varied by 500 tons per day in 24 hours. This tendency is accentuated when speaking about special coke, such as open fire coke, when the normal percentage of 10% has suddenly jumped to 25% in a cold spell. Since orders for special fuel are usually for small amounts and scattered over wide areas, particularly in new housing estates, the difficulties of delivery are greater than is indicated by the tonnage. A sudden increase in the number of deliveries per load slows up the rate of delivery and adds to the already difficult loading conditions on the works.

The actual operation of coke delivery begins, I maintain, at the point where the coke is being loaded from the hopper into the sack; I say it advisedly from the transport point of view because the load going out is the responsibility of the driver, and the safety and convenience of the load start with the way the loader puts the " toe " in the sack, and how he places the key sack into the lorry.

The handling of coke in sacks is not just a matter of brute strength, but a skilled operation. For instance, it is not generally appreciated that once the coke has run down to the toe of the sack and the sack has been placed on the lorry and taken off, it will not go back again in the same formation. This is one of the snags in otherwise nice looking schemes of bulk handling of sacks, transhipment, shuttle services, and the like. Loading coke overnight is frequently suggested but there are pitfalls here—hot coke, wet coke, pilferage, weight on tyres, and lost loads the following day.

There is a fruitful field for investigation in the design of the coke delivery truck, since the type of delivery point infinitely varies from say, 2 cwt. at the back of a prefab estate, in a narrow alley, or in a congested city area, to several tons at a time tail-chute in a wide hospital yard, which perhaps is approached by an extremely narrow street. By this, I mean that when handling a large volume of coke orders at one time (say 60,000 sacks per day) it is necessary to have vehicles which will take care of all these conditions.

When every new vehicle comes in, it is photographed against a large scale with a movable pointer, from which the dimensions can be judged by eye. These photographs are useful when making quick estimates as to the suitability of a vehicle for a particular job.

One thing to make common on all vehicles is the most convenient loading height for the average man's back, and this again matches up with the loading banks—the figure happens to be 3 ft. 10 in., taking into account the varying deflections on the back springs. Then it is necessary to make a judicious selection of the numbers of the various sizes of lorries required. One can then deal with the shape of the body, which has to conform to dimensions laid down by the Road and Rail Traffic Act. Generally speaking, 5 tons is the largest load which can be put on a 30 m.p.h. chassis, within the Regulations, on four wheels, and with the proviso that not more than 20 rider sacks need be carried. It is on the 50 cwt. and 2-tonners that one can make the variations with the various unloading conditions.

For instance, it is possible to put two tons on the floor of a short and comparatively wide body, or on a long and narrow body, in which it will be contained within the overall length permitted. We have the former type in the overtype Commer. This has a very small turning circle, rather like a taxi-cab, and is useful for twisting streets, but owing to its comparative width is quite hopeless for backing into narrow entries. A few details of the special requirements of coke bodies I think would be of interest.

We never have anything but stanchions and chains, and from the safety point of view we always insist on these being in place, although a properly keyed-in coke load will stand by itself. From the men's point of view, we try to keep riders down to not more than 20 per load, and we make the top rider rail slope forward to get the necessary key for the riders.

Wear and tear on floorboards is heavy, and therefore they should be made of oak, and, depending on the type of unloading, whether from the tail or from the sides, boards should be set sideways or longitudinally. There should be ample inspection holes over the salient servicing points let into the floor, and the floor as a whole should be amply drained to take care of weather conditions, so that sacks are not sitting in pools of water. We do this on these bodies by having ¼ in. gaps in the boards, and chamfered edges on the boards, in the same way as with self-cleaning coke screens. The timber, however, must be of first-class quality to obviate splitting at the edges.

Inside the cab there are special arrangements for the driver's mate which are common to all our vehicles. It is necessary to make provision, as it were, for the driver's " office work," by having a proper light and a specially designed box in which to keep delivery tickets. Do not forget that somewhere on the vehicle there has to be accommodated a scale box containing scales and weights, which influences considerably the distribution of the load.

Where you are so forced by size restrictions or awkward type of unloading points to have a man climb on the body to unload conveniently, safety steps should be fitted for him to do so, but it is possible to design a 5 ton coke vehicle so that all the sacks can be got down without a man getting on to the body at all.

Owing to the difficulty of obtaining labour to handle sacks, there was during the war a considerable swing-over to the delivery of coke in bulk, but this tide is now somewhat receding, helped by the fact that the regulations are once again being strictly interpreted as to delivering coke loads across the pavements, and the cellars which had been used as air raid shelters have been converted back to their own use.

Nevertheless, there is a greater demand for bulk vehicles, and the due proportion of the small or large vehicles has to be calculated.

For large bulk jobs, Principality vehicles with moving rubber floors demountable drop sides, and duel hinged tailboards are very useful since they can be used not only for coke, but for stores, pipes, and stoves. They can discharge a 7 ton load of coke in about 4½ min. It is now possible to obtain a 9 yard body on the ordinary Ford 7.V. chassis.

* From a paper to the Southern Association of Gas Engineers and Managers (Eastern District), Nov. 30, 1948.

It is advisable to maintain an emergency service so that in cases of need, such as special orders, hospitals, sudden illness, and the like, coke can be sent to customers at any time, day or night.

Orders for coke are received by the coke department; these orders can be sub-divided into daily standing orders and orders which occur at irregular intervals. When the order is received it is checked as to correctness of address, whether it is for the grade normally delivered to that customer, and, what is most important, whether it is within the ration scale laid down by the Ministry. The orders are then passed to the allocation section of the coke department, where they are made up into lorry loads according to the lorries advised by garages as being available for coke. The tickets are then typed and listed on garage sheets ready for delivery to transport garages. Nowadays this work is normally made up three days in advance of the actual delivery date.

On receipt of the coke orders, garages commence to allocate the made up loads to vehicles, taking especial note of customers' requirements as to time and method of delivery, size of delivery, and number of men required. The transport operators plan the work for the next day according to the amount and grades of coke available at the various works, endeavouring to stagger loading as far as possible.

If a carman is unable to effect a delivery because the customer is out, he telephones his home garage, who in turn obtain another address to which he can divert the coke.

On completion of the day's work, the crews return to their home garage, handing in the signed portions of the tickets; these portions are checked against the garage sheets by the garage staff.

It is worth giving attention to the handling of sacks, particularly when it is realized that the sack itself is worth more than the coke which it contains, and that a good, old used sack is better than a new one from the loading point of view. It is worth while also paying attention to the various sizes of sacks for the various types of coke which have to be handled. Sacks vary from 54 in. to 57 in. by 27 in., but generally give the effect on the floor of the lorry of about 14 in. square. In winter, even with well-drained lorry floors, the sacks get very sodden, and this causes trouble with the customers and with the men; furthermore, it is detrimental to the men's health.

I would draw your attention to the advantages of a sack-drying plant, which can be continually drying the working stock of sacks. This machine can be operated by a light duty man, and by hanging sacks around the plant it is possible to dry 300 in an 8-hour day.

Works Requirements

The requirements of the vehicles which handle materials on the works are highly specialized. Generally speaking, the work is very heavy, and with the best will in the world vehicles are subject to heavy overloads—for instance, when a load of wet breeze is dropped into them.

Speeds are low, and, since it is generally three-shift work, reliability and manoeuvrability are absolutely essential. For the very heavy loads, and where there is room, steam wagons burning the industry's own cokes are ideal. At the other end of the scale, for rough and heavy ground, I would have dumpers, particularly of the new reversible control type, which can now be legalized for running on the public highway.

In between these two extremes, special short chassis tippers with small turning circle can be used. Once upon a time I would have advocated hand tippers, which are quite fast enough for most works jobs, and cheaper and more reliable, but with the present labour shortage I am afraid hydraulics are essential.

For the handling of small and slowly accumulating loads on the works, I would advocate a train of Dobbin trucks on pneumatic tyres, which can be left at various points on the works and picked up for discharge once or twice a day by a tractor such as a Fordson or Ferguson.

For the storage of coke and coal in quantities, it is now possible to make stock heaps with the ordinary tipping lorry, by making use of the temporary track developed during the war for aerodrome construction. Using this means, materials can be stocked at remarkable gradients, with remarkably little damage and at remarkable speeds.

Under works also comes the handling of inter-works deliveries of benzole, crude tar and liquor, gas oil, and oil gas tar, which services are becoming of increasing importance, and each division has its particular problems.

Benzole, of course, requires vehicles designed to the very strict provisions of the Petroleum Spirit (Conveyance) Regulations, and these have to be of the highest mechanical reliability, since, generally speaking, storages are not large and stoppage of production owing to inability to carry the load would be very expensive. The tankers are of aluminium and the valve gear has to be of a special type.

Crude tar and liquor transport is an easier problem, but in times of stress has to be organized for a 24-hour service. It is not always necessary to supply vehicles with their own pump. Liquor, of course, has to be handled with steel tanks. The handling of gas oil and the return of the oil gas tar produces a rather important but comparatively easy job, though the latter is apt to be a bit messy.

Apart from the very specialized vehicles which are required for cresylic acid, for which the tank has to be galvanized; toluole, xylol, or white spirit, which requires a stainless steel tank with special valves; concentrated ammonia which requires a steel tank and cast iron valves, and pitch creosote mixture for fuel purposes, there is soft pitch delivered to customers which can at times prove a headache. The last requires very careful lagging and design of suction and delivery, particularly in cold weather. The steam wagon is, of course, peculiarly suitable for this work.

Tar Spraying

We now come to the main tanker load, which will be more and more important in the future—tar spraying—with which is included the delivery of refined tar in bulk to customers.

Tar delivery is a highly specialized seasonal job, and there is a big swingover from bulk handling and barrels to spraying of hot tar direct on to the roads. This swing is shown by the following table:

	1938	1947
Spray	40%	69%
Bulk	26%	21%
Barrels	34%	10%
	100%	100%

The function of the road sprayer is to convey tar at a temperature of 300° F. from the loading point on the works to a road site anything up to 100 miles distant, and to arrive there with the tar as near to the loading temperature as possible. On arrival, the vehicle must be capable of spraying the tar on to the road surface in an even film, at any reasonable rate asked for by the local authority.

Experience has shown that the most economical tank capacity is 1,500 gall. and that 3 in. of lagging is necessary to maintain the tar at a working temperature for the necessary interval of time. Since road tar is not classed as an inflammable liquid, a single compartment tank of this capacity is in order. There is a greater and greater insistence by the customers on the accurate gallonage sprayed on the road; this, of course, depends on the design of the tank.

After the war we had to do the best we could to get some sprayers on the road at short notice. This involved a great deal of improvisation.

Tar spraying is liable, unless carefully planned, to be hampered by the Road and Rail Traffic Act Regulations regarding the permissible hours for drivers, and it is no longer possible to run men out to distant jobs by passenger tender, since a driver under orders from his employer is now deemed to be working. There are times when it is necessary for the crews to live near the job, and their machines to be supplied by bulk tankers from the works.

Tar spraying men should be carefully chosen. It is found of great value in April each year to give a series of lectures to new men taken on, and a refresher course to the older men, where the particular difficulties met with during the previous year are fully discussed and, if possible, corrected.

Before the war, when dual purposes bodies for tar spraying and coke handling could be operated, a special tackle for the changing over of bodies installed in one of the garages was of great value. This enables bodies to be changed over in one day instead of three, and in the change-over period, spring and autumn, it is possible to work to much finer margins, and keep vehicles in their proper work up to the last minute.

Distribution

Generally speaking, as compared with before the war, the number of vehicles on "distribution" has largely increased, and more men have to be carried to and from road jobs. In addition, the demands for syphon pumping have been increased and the methods of dealing with this have been modernized. Two or three tanks have been mounted on old chassis. From the R.A.F. disposal we obtained exhauster compressor sets driven by J.A.P. industrial engines. These vehicles are of great use in clearing syphons from trunk mains. The design of compressors is an interesting problem, and it is now thought better to mount separate independent compressor engine units on specially designed chassis rather than to try to combine the functions of the compressor and the lorry, using the lorry engine to drive the compressor.

Cabs should be roomy and large enough to take a gang as well as a driver, and there should be emergency seating for extra emergency gangs. Radiator shutters should be fitted to the main engine to conserve heat while standing on the job and going to the job. The tools should be mounted on special brackets, so that they are always to hand. I do not care for tool boxes, since they soon tend to be full of old iron. Hoses should be mounted on hose wheels. For night work a completely separate lighting system, batteries, and generators working from the compressor should be fitted, and hand starting should be done away with as far as possible. Since jobs frequently occur after working hours, a standby service has to be arranged to deal with emergency calls. Standby men are available at main garages.

Sales and Fittings

A percentage of about 12 is required for the delivery of gas appliances. These vehicles vary a great deal in size and shape for their particular purposes, and it is most important that the bodywork should be designed especially to suit the type of work. A new develop-

ment lately has been that of a travelling foreman's office van from which work is sent out to a team of fitters.

Coin Collection

The collection and exchange of coin is an exceptionally hard service for vehicles. The vehicles often have to work in congested streets, and to avoid difficulties with traffic congestion they should be very mobile. The loads of coin are very heavy and concentrated, and naturally is it worth paying some attention to having a good hard wearing floor. A successful experiment was carried out by the purchase and conversion of taxi chassis, but of course the rear springs and tyres had to be strengthened to carry the load, which came up to some 30 cwt. Some form of standardization is now in process of being carried out with a short wheelbase 30 cwt. machine, with both rear and side doors and sufficient headroom, so that the necessary " office work " can be carried out in reasonable comfort. Here again, since a great deal of work is low gear traffic work and then periods of standing, good control of engine temperatures is necessary.

Vacuum service cleaners seem, by virture of increasing demand for their services, to have proved themselves, and it is understood that they show a great saving in material and labour on the district. Generally speaking, they consist of vans carrying a self-contained unit of a small exhauster driven by a converted motor-cycle engine, and a small tank. Here again the mileage is not great but there are long periods of standing. Care should be taken in the design, so that the tank with its sludge can be easily emptied, and that it does not get overfull, since by carelessness, a heavy load can easily be put on the back axle. I prefer the self-contained unit, since the engine and exhauster unit needs a certain amount of maintenance, and it is better to be able to lift the whole apparatus out of its bedplate and replace with a spare one.

Low loaders are in great demand. Though good loading facilities may exist at works and depots, it is a different picture when pipes, and so on, have to be off-loaded or loaded on the district, where no craneage or ramps are available. The employment of such vehicles facilitates completion of the job, saves breakages, and, what is most important, reduces the risk of accident to the men engaged in handling the load.

For improved communications at a low cost, experience has shown that an express letter and parcel service is a valuable section of the fleet.

Mobile showrooms play an important part in obtaining new housing business. I am engaged at present in converting two Dennis 3-ton box vans. These are to be fitted with portable entrances and end stairs with a hinged canopy over the entrances. Display windows have been made in the sides of the vehicles, and inside are displayed cookers, fires, wash boilers, washing machines, refrigerators, &c. A small desk and chairs with suitable lighting make a pleasant showroom. Provision has been made for the securing of all this impedimenta when the vehicle is in transit.

Maintenance and Repairs

The regular attention and periodic repair necessary for the efficient operation of any fleet of vehicles are imperative in the case of the vehicles of a gas undertaking, operating, as they do, in particularly arduous conditions and under varying commitments. It is almost impossible in a large undertaking to cover the varying needs for transport by such similar types of vehicles as will permit of any considerable degree of standardization, and, therefore, the expedient of exchange of replacement units is not easily workable. Regular and well-defined maintenance of vehicles at short intervals, together with a thoroughly planned and controlled system of periodic repair, is therefore necessary. The impossibility of purchasing new vehicles in any adequate numbers has resulted in an exceedingly heavy load for maintenance and repair of old vehicles being imposed on the repair organization at a time when shortage of spares—particularly those applicable to the old vehicles requiring attention—is acute. New vehicles also, when available, have not been found to have the sturdy construction and high quality of material as in pre-war years. There is thus a need for increased maintenance on new vehicles in an attempt to prevent them from becoming old before their time.

In the halcyon days before the war, it was found a possible—and a good paying—proposition to abandon all idea of the complete overhaul of vehicles, and to substitute in its place a regular schedule of dock overhauls every four months, in the course of which every vehicle in the fleet received regular attention three times every year to all its components, and during which time faulty sub-units were removed and overhauled, or replaced with a service unit. By such means, not only was the need for complete overhaul of vehicles, with its consequent loss of use of the vehicle for an appreciable period, considerably reduced, but the cost of repairs dropped as low as 1d. per mile. The time lost on involuntary failure dropped to as low as 0.5% of total lorry hours, in a fleet of over 500 vehicles, and the mileage run between involuntary stoppages increased by more than 1,000 miles—from 2,200 to 3,500.

Such results were practical and could be forecast in normal times. The picture is very different now, since the war years have taken their toll in the form of overworked vehicles, lack of facilities and staff for regular maintenance, and non-replacement of vehicles. If, to-day, a periodic dock repair (which used to be called—somewhat euphemistically—a " two-day overhaul ") is attempted, it is found that the preliminary examination reveals such a multitude of jobs requiring urgent attention that nothing short of a complete overhaul will meet the case. This position has therefore had to be accepted, and an attempt made to control it by increasing the degree of regular maintenance given, and by planning in advance the overhaul programme. Probably the ideal governing factor for the period between overhauls would be that of mileage, but it is found that this mileage figure varies so much between different types of vehicles, and moreover the varying duties of the vehicles themselves cause such varying degrees of wear that the mileage interval is unreliable. In addition, the traffic needs of the fleet are such that arrangements for vehicles to replace those withdrawn for overhaul must be made in advance. The interval between maintenance and overhaul attention has, therefore, been fixed on a time basis. The organization exists for finding out the condition of all vehicles and for doing something about it on a controlled basis. Overhaul being at present necessary for the reconditioning of old and worn vehicles, is planned twice yearly. In the summer half-year the greater proportion of overhauls is to coke vehicles, and in the winter half-year to tar-spraying vehicles, advantage thus being taken whenever possible of the slack season for operation.

I think the following analysis would be of interest:

	Percentage of total lorry hours
Brakes	0.06
Ignition (other than plugs)	0.07
Plugs	0.04
Petrol system	0.1
Cooling system	0.04
Exhaust system	0.03
Lights and starters	0.06
Tyres	0.05
Transmission (gearbox, shaft and back axle)	0.05
Total time lost all failures	0.5

The question of spares becomes daily more difficult, especially as the allocations of steel available to manufacturers allows very little —if any—provision to be made for spares to old vehicles. Recourse has had to be made on more than one occasion to the breaker's yard, and to avoid, as far as possible, this final humiliation to a repair shop manager, a section has been set up for the " cannibalization " of old vehicles. If a mechanic requires a part which he cannot obtain he will secure this part from some vehicle which is at the time a non-runner, rather than admit defeat.

Apart from the work at the main repair shops, a certain amount is decentralized to suitable garages located at strategic points in the area of the undertaking. Repairs are carried out by a qualified staff of mechanics operating under the control of the manager of the main repair shops. This method saves much mileage and time, but the difficulty is to define the limit of the work which should be undertaken in these outside stations. For practical purposes, it has been ruled that the line must be drawn to include engine decarbonization, and the replacement *in situ* of major unit assemblies (engines, steering box, &c.), which are then returned to the main repair shops for overhaul and replacement.

To keep a vehicle cleaned and serviced up to standard requires about 3½ hours per week. This work is carried out during the night, so that no working time is lost during the day.

Tyres

Tyres can be a very costly item not only in themselves, but particularly in time lost on the road, but the introduction of a centralized tyre depot will generally solve the problem. Tyres, if found on examination to be damaged, are taken off and vulcanized. By so doing, tyres run their full mileage, somewhere between 18,000 and 20,000 miles, though before the war, between 35,000 and 40,000 per cover was obtainable.

Large vehicles, except those going on long runs into the country, do not have to carry spare wheels. This is a saving in many ways, and the abolition of spare wheels and covers reduces the first cost of vehicle by a considerable sum.

The difficulties of supply in the war years and after have resulted in the fleet being shod with very mixed tyres, both of makes and types, with resultant mismatching.

All garages built recently have had incorporated a 6 in. slope on the floor from the back to the front, so that, in the event of fire, machines can be run out easily under gravity. Hydrants should be placed on the open side of the garage, so as to render them more accessible in the case of fire. So far as possible, the garage equipment in the form of washing machines, greasing plants, petrol, oil, and tyre pumps, should be standardized. I have always felt very strongly on the subject of proper heating in garages, not only for the welfare of the machines and the preservation of the bodywork, but also for the men who drive them. After several years of experiments of various systems, I am convinced that the most efficient and also the cheapest method of heating is by means of low pressure steam feed lines to the vehicle radiators, with the development of which we had a considerable amount to do.

The advantages are as follows: An easily controlled form of heat is first applied where it is needed most—that is to say, to radiator and water jackets. The heat then passes by conduction down to the sumps, and keeps the oil at a reasonable viscosity, and from there to clutch and gearbox, and afterwards keeps the cab of the vehicles warm and dry. As a result, vehicles start instantly in the morning, either on the handle or the starter, without the necessity of choking, thereby saving a great deal of petrol and cylinder wear: through not having to be towed, there is a great deal of saving of load on clutches, gearboxes, transmission, springs, and tyres. The men themselves can go out on time, in a cab which is warm and dry, and are not exhausted by trying to swing a cold engine.

It is difficult to prove the mechanical advantages of this system, but I think the following figures are not without significance:

Garage	Percentage lorry hours lost: Transmission failures	All failures
A (52 lorries). No lorries on steam heating, good normal coke heating ..	0.09	0.9
B (104 lorries). 50% lorries on steam heating	0.06	0.48
C (32 lorries). 100% steam heating ..	0.014	0.2

The coachwork of vehicles which are on this system in closed garages certainly remains in better condition than that of vehicles on other systems. Also vehicles can be stored in the open in safety since it is only necessary to put up a steam line to feed them, although I do not recommend the sorting of vehicles outside if it can possibly be avoided.

DISCUSSION

Mr. **W. K. Tate** (Portsmouth), Chairman, remarked that during the war he was privileged to act as a transport manager of a large London undertaking for some few years and during that time he had reinforced his interest in transport and realized what a very important branch of an undertaking's operation it was, and how many savings could be made in this branch and added facilities gained when it was properly organized. Referring to Mr. Lawrence's table of figures for the ton-mile operation of vehicles, he remarked that while Mr. Lawrence's figure for coke delivery was 28%, the Portsmouth figure was 18%. The speaker's works figure was about 18% compared with Mr. Lawrence's 39%, but these were not easily comparable, because the Gas Light and Coke Company figure included tar spraying. On sales and fittings, the Gas Light and Coke figure was 15%, while the Portsmouth figure was 20%, and on distribution the figure given by Mr. Lawrence was 8% compared with one of 39% at Portsmouth. The Portsmouth figures were complicated because the undertaking carried 75% of its coal by road to two of its works. The author had made a great point of body-building, care for the workmen, and various refinements, all of which were valuable, and his experience at Portsmouth had shown how necessary it was not to buy vehicles " off the peg." The gas industry had bought vehicles off the peg in the main for many years and had, as it were, bent their activities to suit the vehicle and not the other way round, as it should be.

Scope for Adaptations

As an industry, there was scope for them to get vehicles built to suit their needs, and the author's illustrations had shown how results could be obtained by small adaptations. He (the speaker) believed that there was a great deal of room for experiment in the use of the new light alloys in the building of vehicle bodies in order to reduce the weight of the vehicle in relation to the load it would carry.

Mr. **T. C. Battersby** (Watford and St. Albans) remarked that Mr. Lawrence had rightly shown how much could be done by adjustment, adaptation, and reconstruction. Most haulage contractors confined themselves to one or two types of vehicle for contracting in a special market. In the gas industry the transport department, in addition to dealing with seasonal variations, had to provide for the haulage of raw materials, of by-products, and for the distribution system, the maintenance of apparatus at consumers' premises throughout its working life, and the collection of coins. This was a vast field of activities and the fleet which Mr. Lawrence had provided was evidence of the care and study he had given to the requirements of the industry.

A Major Operation

The conversion of the R.A.F. tanker which the author had described was a major surgical operation and one which few of them could undertake. In connexion with these converted Army vehicles, he wondered why they had been warned to take care with the four-wheel drive, because he had thought that for many purposes this pattern would be useful, particularly on new estates where roads were bad. The paper had raised the problem of coke delivery, not inappropriately because this was one function common to all undertakings. Mr. Lawrence had said that coke delivery commenced at the hopper where the vehicle was loaded. Not being a 100% transport official, he rather believed that coke delivery commenced when the vehicle left the garage, because a lot of time could be wasted in waiting at the hoppers for loads, more time, in fact, than was lost by involuntary functional failures, which at 0.5% of the total lorry hours was a remarkable figure. The author had omitted, probably intentionally, any reference to costs, though they must have some yardstick for assessing a transport department. In the case of Watford and St. Albans, transport costs were in the region of 0.63d. per therm of gas, which was approximately 5% of the total expenditure per therm. It was, therefore, a matter of some importance as to how they spent their money on transport, but he appreciated that these costs must vary throughout the country in accordance with the degree of mechanization, interpretation of consumer service, and local conditions. They were grateful to the author for his detailed account of the organization lying behind his large fleet, but he (the speaker) was surprised that, despite the tyre inspection service, the life of tyres was so much less than it was before the war. Steam wagons were useful on heavy roads and he believed that the manufacturers were coming back into production.

Mr. **J. D. C. Woodall** (Maidstone) said that although many of the vehicles described in the paper were more elaborate than most of them could usefully use in their own undertakings, the paper was full of valuable advice which members in charge of quite small undertakings could usefully follow up. When they had had a new garage built at Maidstone, they had adopted the Gas Light and Coke Company's system of heating. He could, in consequence, fully endorse all that Mr. Lawrence had said about this system: it had saved work on the part of drivers and had prolonged the life of vehicles. It occurred to him that there was one improvement which might usefully be installed in their vehicles. This was the type of air heater now fitted on many cars and which was common in America. This system, which could draw hot or cold air into the cab and could prevent freezing up on the windscreen, could do much to increase the safety of vehicles. Mr. Tate had mentioned that the gas industry ought not to buy standard vehicles, but the smaller undertakings could not afford to follow this advice, and at Maidstone they had had to buy a number of standard vehicles. One vehicle which had proved very useful to them was a machine usually supplied to Kent farmers, costing less than £300 and driven by an 8 h.p. engine. This was capable of carrying about a ton of coke.

Mr. **R. Slaymaker** (Wandsworth) said that his Company, on the question of van design, was taking a step forward regarding vans for delivering apparatus on the district. It was developing one with a duralumium body which would be 17 ft. long, 6 ft. 6 in. wide and high, and would have two floor levels, including a well at the rear 4 ft. behind the rear axle. It would have a roller shutter on both sides, forward of the rear axle, shelving, and a drop tailboard with a roller shutter above it. This tailboard could be run up to the level of the main floor for loading. The body would weigh just about a ton, and he agreed that there was a field for investigation in the use of light alloys. In this way it would be possible to get down to a reasonable weight with a durable body which would last for years.

Mr. **L. J. Keslake** (Bournemouth) said that it had been noticeable that most of the vehicles shown by the author had been of the expensive class. What was the reason for the concentration on this class of vehicle ? At Bournemouth they had a number of these types, but also many others which gave good service. They had found over a number of years that the not so highly priced vehicles were less costly to maintain.

Mr. **J. W. Townsend** (Tunbridge Wells) said that at his undertaking there were about 30 vehicles with one fully qualified mechanic to look after them. They had tried to standardize, as this made maintenance easier in a small concern. Their policy as regards retreading tyres was to have their own covers treated and returned to them. In this way they got about half as much wear from the second use as from the original tyre.

Mr. **J. Mepham** (Watford) said that their practice was to run a 3 ton lorry with one man doing up to 10 tons per man per day delivery. Was it economic to run a 5 ton vehicle with two men on coke delivery ?

The Author's Reply

Replying, Mr. **Lawrence** said he was glad that his view that vehicles should not be bought " off the peg " had been supported. With a standard " off the peg " body and a full coke body they got a bad view to the rear. He suggested that the problems of speeding coke delivery could be best solved by co-operation between the departments concerned. He could not give a cost per therm of gas for the Gas Light and Coke Company's transport, but it would be interesting to work one out, though many intangible factors came into transport costing. As to the retreading of tyres, he found that they got two-thirds of the mileage back after treatment. Their drivers had plenty of incentive to good driving from the competitions they ran, as they were given a monetary reward of five guineas for five years without an accident. He had not referred particularly to steam-driven vehicles in his paper because most of the paper had been written before the manufacturers' announcement that they were going into production again; but he certainly favoured them for certain types of work. He believed that the air heating of cabs was desirable.

A vote of thanks to Mr. Lawrence was moved by Major C. R. M. **Croft** (Wandsworth) and seconded by Mr. **Frank Dawson** (North Middlesex).

The Megator Pump

In our description of the Megator pump, on page 508 of the Dec. 1 issue, we regret that the capacities were incorrectly given. The range should be from 250-6,000 gall. per hour, not 250-600 gall. as previously stated.

New Pallet Truck

Lansing Bagnall, Ltd., Worton Road, Isleworth, Middlesex, have produced the first all British power-operated pedestrian controlled pallet truck. The standard model has a maximum capacity of 4,500 lb., and weighs only 10 cwt., with forks 36 in. in length and 27 in. wide. These can be supplied in several lengths to suit varying applications. The overall length is 5 ft. 1½ in. with a wheel base of 3 ft. 9½ in. A new electric circuit makes the vehicle ideal for female and junior operators. Operation is simple, all controls being situated in the handle. Twist-grips control the speed of movement. A finger switch gives forward or reverse and a small key switch is provided for immobilizing the vehicle. Incorporated is a built-in charger and each vehicle is supplied with a plug and lead so that all the operator has to do is to plug into the nearest 15 amp. power point and switch on when charging starts with automatic control.

Danish Gas Company

The accounts for the year ended June 30 presented at the 94th annual general meeting at Odense on Dec. 13 showed that after charging administration, pensions, &c., and transferring Kr. 336,143 (Kr. 19.36 = £1) to the redemption accounts and Kr. 150,000 to renewals account, the balance standing to the debit of profit and loss account was Kr. 178,829. Work on the overhaul of part of the carbonizing plant was begun early this year and the cost incurred up to June 30 had been met partly by the transfer to renewals account and the remainder out of the balance on that account brought forward from last year. Capital expenditure of Kr. 189,985 for additional mains, meters, &c., was incurred during the year, and all necessary repairs were carried out so that the works are in a condition to meet any demands likely to be made on them during the winter. A further instalment of the programme of reconstruction of the carbonizing plant will be carried out in the spring of 1949. The Company continues to suffer from the high price of coal in Denmark, which is subject to a Government levy, while it is impossible to derive a commensurate income from the sale of residuals, the selling prices of which are controlled.

To enable shareholders resident in Britain to meet the English Directors before proxies were sent over for the general meeting, an informal meeting was held at the London offices, 6, Drapers Gardens, on Dec. 10, at which Lieut.-Colonel H. F. Bidder made sympathetic reference to the death of Mr. Henry Woodall, to whose retirement from active participation in the Company he had referred at the previous year's informal meeting. Lieut.-Colonel E. C. Woodall, Chairman, expressed thanks to all the staff and workmen, both those employed under Mr. Edwards in Odense, and in the London office under Mr. A. L. Janssens. He also thanked Mr. E. A. L. Petersen, Vice-Chairman, for his excellent work in negotiating with the Commune.

GAS STOCKS AND SHARES

Last week's total bargains on the London Stock Exchange, at 31,528, were 1,319 lower than in the previous week, Wednesday's 5,635 being the lowest since Sept. 24. The week opened with small sales and lack of fresh buying, with consequent slight losses in prices. British Funds opened lower on seasonal sales, and industrials were again quiet and mainly dull. By the middle of the week the approach of Christmas appeared to be making itself felt; industrials were steadier but there was no indication of any broadening of interest, and movements showed some irregularity, with slight improvements in several of the leading shares, though the rises seldom exceeded 3d.

Business in gas stocks followed very much the usual lines, with a total of 229 dealings for the week, compared with 214 for the previous week. In the corresponding week last year the figure was 211, followed by a jump to 403 in the week immediately before Christmas. The principal price changes during the week were in British-owned overseas undertakings. Bombay showed a drop of 10s. from 47s. 6d. to 37s. 6d., Imperial Continental a fall of two points, and Primitiva Holdings a fall of 6d. The general trend among undertakings subject to nationalization prospects was upward, though South Metropolitan were a point down on the week. The rises and falls were as follows:

OFFICIAL LIST

Bombay, Stock	35s.—40s.	—	10s.
Brighton, 6 p.c. Std. Cons. ...	112 —117	+	1
Croydon, Sliding Scale	120 —125	+	1
Eastbourne, "A"	101 —105	+	2
Great Yarmouth, 8½ p.c. Max. ...	13¾—14¾	+	¾
Imperial Continental	110 —115	—	2
Plymouth and Stonehouse, Ord. (xd Dec. 1)	111 —116	+	2
Do. Additional (xd Dec. 1)	14¼—15¼	+	⅜
Do. New (xd Dec. 1)	13½—14½	+	½
Primitiva Holdings, Ltd., Ord. ...	9s.—11s.	—	6d.
South Metropolitan, Ord. ...	102 —107	—	1

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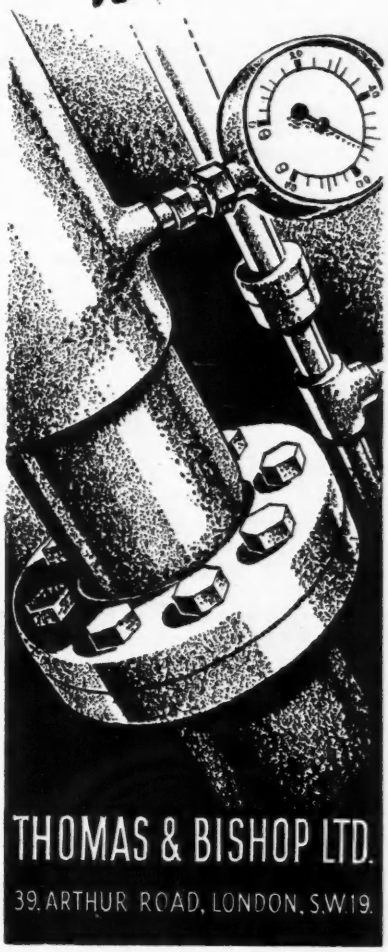

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ONX SUPER 83 BRAND FIRE CEMENT

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"We are pleased with results obtained after using ONX Super '83' Brand.
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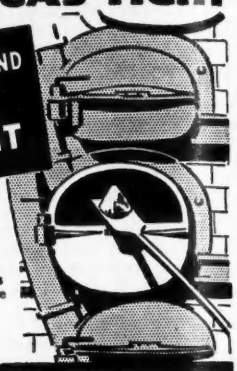
"Now, six months after repairing 28 retorts they appear as sound as ever; we anticipate the life of the settings will be prolonged."



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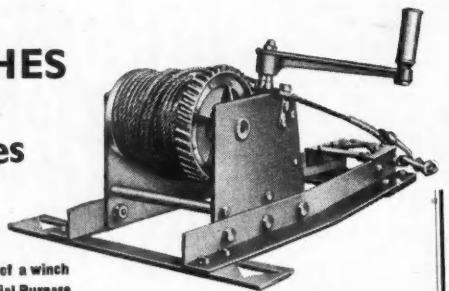

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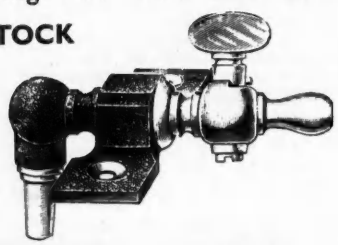

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